

5-7 Skills Practice

Rational Exponents

Write each expression in radical form.

1. $3^{\frac{1}{6}}$

2. $8^{\frac{1}{5}}$

3. $12^{\frac{2}{3}}$

4. $(s^3)^{\frac{3}{5}}$

Write each radical using rational exponents.

5. $\sqrt{51}$

6. $\sqrt[3]{37}$

7. $\sqrt[4]{15^3}$

8. $\sqrt[3]{6xy^2}$

Evaluate each expression.

9. $32^{\frac{1}{5}}$

10. $81^{\frac{1}{4}}$

11. $27^{-\frac{1}{3}}$

12. $4^{-\frac{1}{2}}$

13. $16^{\frac{3}{2}}$

14. $(-243)^{\frac{4}{5}}$

15. $27^{\frac{1}{3}} \cdot 27^{\frac{5}{3}}$

16. $\left(\frac{4}{9}\right)^{\frac{3}{2}}$

Simplify each expression.

17. $c^{\frac{12}{5}} \cdot c^{\frac{3}{5}}$

18. $m^{\frac{2}{9}} \cdot m^{\frac{16}{9}}$

19. $\left(q^{\frac{1}{2}}\right)^3$

20. $p^{-\frac{1}{5}}$

21. $x^{-\frac{6}{11}}$

22. $\frac{x^{\frac{2}{3}}}{x^{\frac{1}{4}}}$

23. $\frac{y^{-\frac{1}{2}}}{y^{\frac{1}{4}}}$

24. $\frac{n^{\frac{1}{3}}}{n^{\frac{1}{6}} \cdot n^{\frac{1}{2}}}$

25. $\sqrt[12]{64}$

26. $\sqrt[8]{49a^8b^2}$

5-7**Practice****Rational Exponents**

Write each expression in radical form.

1. $5^{\frac{1}{3}}$

2. $6^{\frac{2}{5}}$

3. $m^{\frac{4}{7}}$

4. $(n^3)^{\frac{2}{5}}$

Write each radical using rational exponents.

5. $\sqrt[4]{79}$

6. $\sqrt[4]{153}$

7. $\sqrt[3]{27m^6n^4}$

8. $5\sqrt{2a^{10}b}$

Evaluate each expression.

9. $81^{\frac{1}{4}}$

10. $1024^{-\frac{1}{5}}$

11. $8^{-\frac{5}{3}}$

12. $-256^{-\frac{3}{4}}$

13. $(-64)^{-\frac{2}{3}}$

14. $27^{\frac{1}{3}} \cdot 27^{\frac{4}{3}}$

15. $\left(\frac{125}{216}\right)^{\frac{2}{3}}$

16. $\frac{64^{\frac{2}{3}}}{343^{\frac{2}{3}}}$

17. $(25^{\frac{1}{2}})(-64^{-\frac{1}{3}})$

Simplify each expression.

18. $g^{\frac{4}{7}} \cdot g^{\frac{3}{7}}$

19. $s^{\frac{3}{4}} \cdot s^{\frac{13}{4}}$

20. $\left(u^{-\frac{1}{3}}\right)^{-\frac{4}{5}}$

21. $y^{-\frac{1}{2}}$

22. $b^{-\frac{3}{5}}$

23. $\frac{q^{\frac{3}{5}}}{q^{\frac{2}{5}}}$

24. $\frac{t^{\frac{2}{3}}}{5t^{\frac{1}{2}} \cdot t^{-\frac{3}{4}}}$

25. $\frac{2z^{\frac{1}{2}}}{z^{\frac{1}{2}} - 1}$

26. $\sqrt[10]{8^5}$

27. $\sqrt{12} \cdot \sqrt[5]{12^3}$

28. $\sqrt[4]{6} \cdot 3\sqrt[4]{6}$

29. $\frac{a}{\sqrt{3b}}$

30. ELECTRICITY The amount of current in amperes I that an appliance uses can be calculated using the formula $I = \left(\frac{P}{R}\right)^{\frac{1}{2}}$, where P is the power in watts and R is the resistance in ohms. How much current does an appliance use if $P = 500$ watts and $R = 10$ ohms? Round your answer to the nearest tenth.

31. BUSINESS A company that produces DVDs uses the formula $C = 88n^{\frac{1}{3}} + 330$ to calculate the cost C in dollars of producing n DVDs per day. What is the company's cost to produce 150 DVDs per day? Round your answer to the nearest dollar.

5-7 Skills Practice

Rational Exponents

Write each expression in radical form.

1. $3^{\frac{1}{6}} \sqrt[6]{3}$

2. $8^{\frac{1}{5}} \sqrt[5]{8}$

3. $12^{\frac{2}{3}} 2\sqrt[3]{18}$

4. $(s^3)^{\frac{3}{5}} s\sqrt[5]{s^4}$

Write each radical using rational exponents.

5. $\sqrt{51} 51^{\frac{1}{2}}$

6. $\sqrt[3]{37} 37^{\frac{1}{3}}$

7. $\sqrt[4]{15^3} 15^{\frac{3}{4}}$

8. $\sqrt[3]{6xy^2} 6^{\frac{1}{3}} x^{\frac{1}{3}} y^{\frac{2}{3}}$

Evaluate each expression.

9. $32^{\frac{1}{5}} 2$

10. $81^{\frac{1}{4}} 3$

11. $27^{-\frac{1}{3}} \frac{1}{3}$

12. $4^{-\frac{1}{2}} \frac{1}{2}$

13. $16^{\frac{3}{2}} 64$

14. $(-243)^{\frac{4}{5}} 81$

15. $27^{\frac{1}{3}} \cdot 27^{\frac{6}{3}} 729$

16. $\left(\frac{4}{9}\right)^{\frac{3}{2}} \frac{8}{27}$

Simplify each expression.

17. $c^{\frac{12}{5}} \cdot c^{\frac{3}{5}} c^3$

18. $m^{\frac{2}{9}} \cdot m^{\frac{16}{9}} m^2$

19. $\left(q^{\frac{1}{2}}\right)^3 q^{\frac{3}{2}}$

20. $p^{-\frac{1}{5}} \frac{p^{\frac{4}{5}}}{p}$

21. $x^{-\frac{6}{11}} \frac{x^{\frac{11}{11}}}{x}$

22. $\frac{x^{\frac{2}{3}}}{x^{\frac{1}{4}}} x^{\frac{5}{12}}$

23. $\frac{y^{-\frac{1}{2}}}{y^{\frac{1}{4}}} \frac{y^{\frac{1}{2}}}{y}$

24. $\frac{n^{\frac{1}{3}}}{n^{\frac{1}{6}} \cdot n^{\frac{1}{2}}} \frac{n^{\frac{2}{3}}}{n}$

25. $\sqrt[12]{64} \sqrt{2}$

26. $\sqrt[8]{49a^8b^2} |a| \sqrt[4]{7b}$

5-7 Practice (Average)

Rational Exponents

Write each expression in radical form.

1. $5^{\frac{1}{3}}$

$\sqrt[3]{5}$

2. $6^{\frac{2}{5}}$

$\sqrt[5]{6^2}$ or $(\sqrt[5]{6})^2$

3. $m^{\frac{4}{7}}$

$\sqrt[7]{m^4}$ or $(\sqrt[7]{m})^4$

4. $(n^3)^{\frac{2}{5}}$

$n^{\frac{6}{5}}$ or $\sqrt[5]{n^6}$

Write each radical using rational exponents.

5. $\sqrt{79}$

$79^{\frac{1}{2}}$

6. $\sqrt[4]{153}$

$153^{\frac{1}{4}}$

7. $\sqrt[3]{27m^6n^4}$

$3m^2n^{\frac{4}{3}}$

8. $5\sqrt{2a^{10}b}$

$5 \cdot 2^{\frac{1}{2}} |a^5| b^{\frac{1}{2}}$

Evaluate each expression.

9. $81^{\frac{1}{4}}$

10. $1024^{-\frac{1}{5}}$

11. $8^{-\frac{5}{3}}$

12. $-256^{-\frac{3}{4}}$

13. $(-64)^{-\frac{2}{3}}$

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Simplify each expression.

18. $g^{\frac{4}{7}} \cdot g^{\frac{3}{7}}$

19. $s^{\frac{3}{4}} \cdot s^{\frac{13}{4}}$

20. $(u^{-\frac{1}{3}})^{-\frac{4}{5}}$

21. $y^{-\frac{1}{2}}$

22. $b^{-\frac{3}{5}}$

23. $\frac{q^{\frac{3}{5}}}{q^{\frac{2}{5}}}$

24. $\frac{t^{\frac{2}{3}}}{5t^{\frac{1}{2}} \cdot t^{-\frac{3}{4}}}$

25. $\frac{2z^{\frac{1}{2}}}{z^{\frac{1}{2}} - 1} \cdot \frac{2z + 2z^{\frac{1}{2}}}{z - 1}$

26. $\sqrt[10]{8^5} \cdot 2\sqrt{2}$

27. $\sqrt{12} \cdot \sqrt[5]{12^3}$

28. $\sqrt[4]{6} \cdot 3\sqrt[4]{6}$

29. $\frac{a}{\sqrt{3b}} \cdot \frac{a\sqrt{3b}}{3b}$

30. ELECTRICITY The amount of current in amperes I that an appliance uses can be calculated using the formula $I = (\frac{P}{R})^{\frac{1}{2}}$, where P is the power in watts and R is the resistance in ohms. How much current does an appliance use if $P = 500$ watts and $R = 10$ ohms? Round your answer to the nearest tenth. **7.1 amps**

31. BUSINESS A company that produces DVDs uses the formula $C = 88n^{\frac{1}{3}} + 330$ to calculate the cost C in dollars of producing n DVDs per day. What is the company's cost to produce 150 DVDs per day? Round your answer to the nearest dollar. **\$798**